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FUNGOUS FLORA ACCOMPANYING DECLINE OF BOXWOOD

C. F. Andrus

Some observations on plantings of Buxus sempervirens and B. suffruticosa in several public parks and on a few estates in the District of Columbia during August and September, 1933, disclosed a rich fungous flora infesting many of these valuable ornamental plants. The organisms named below include only those observed to be more or less prevalent. No mention is made of numerous miscellaneous species that were observed or were isolated only once.

A species of Verticillium has become deeply systemic in numerous older plants of both species of Buxus. The pale pink fruiting bodies, or sporodochia, were produced abundantly on the surface of the bark covering cankers on the main limbs and trunks. Dying branches were frequently found to be completely girdled at their base. The Verticillium was also isolated from rootlets and main roots. The fungus is probably Verticillium buxi (Link) Sacc. which is regarded as a growth form of Volutella buxi (Corda) Berk. It may also be identical with Verticillium compactiusculum Sacc. The Verticillium appears to be the immediate cause of wilting and death of numerous individual branches, sectors of plants, and occasionally of whole plants, but other conditions, such as winter injury, root asphyxiation, and miscellaneous root parasites, may have rendered the plants more susceptible to attack by the fungus.

Volutella buxi (Corda) Berk. was observed causing severe leaf and twig infections on both Buxus sempervirens and B. suffruticosa. The Volutella stage is distinguished from the Verticillium by the presence of setae among the mass of spores on the sporodochium. In a few instances the Volutella stage was observed fruiting on the surface of the bark above large trunk cankers and was isolated from beneath the bark. In pure culture the Verticillium and Volutella are distinguished only by the color of the spores in mass and by the presence or absence of setae.

Immature perithecia of Nectriella rousseliana (Mont.) Sacc. were found on Volutella-infected leaves of Buxus sempervirens early in August.

A later search for mature fruiting bodies was unsuccessful. This Ascomycete is regarded as the perfect stage of Volutella buxi.

A species of Nectria, apparently N. desmazierii De Not., was observed in considerable abundance on the bark of lower limbs of both Buxus sempervirens and B. suffruticosa. It did not appear until late in September. It was frequently associated with Verticillium but also occurred alone. An attempt to isolate single ascospores gave only Verticillium. The Verticillium cultures, when paired on agar media, showed no inclination to form perithecia.

Fusarium semitectum Berk. et Rav. var. majus Wr. was very prevalent on Buxus sempervirens, usually being associated with Volutella on dead leaves and twigs and in new twig infections. It was especially abundant on corky papillae of diseased stems on a few plants in a late stage of decline. The species may be identical with F. lateritium Nees. var. majus Wr., previously described on Buxus.

Macrophoma candollei (B. et Br.) Berl. et Vogl. was commonly present on dead leaves of both species of Buxus. It appears to be wholly saprophytic.

Phoma conidiogena Schnegg was found to some extent on practically all box plants examined. This fungus is associated with a silver-grey leaf tip infection and occasionally plants are considerably disfigured by the presence of numerous withered leaf tips.

A species of Phomopsis, probably P. stictica (B. et Br.) Trav., was isolated frequently from the wood of wilted branches and from corky papillae on stems.

A species of Colletotrichum was isolated from discolored leaves of Buxus sempervirens and from twig stems of B. suffruticosa. A few inoculations on leaves of small suffruticosa plants indicate that this fungus is an active parasite and is probably responsible for considerable leaf casting.

Isolations from roots of diseased box plants were made on two occasions. Rootlets from a large plant of Buxus sempervirens yielded Fusarium solani (Mart.) App. et Wr., F. redolens Wr., and Phytopthora parasitica Dastur, in addition to Verticillium. The diseased root crown of a recently dead plant of B. suffruticosa also yielded Phytopthora parasitica in addition to Verticillium. It appears probable that in particular instances Phytopthora is an important primary agent in the decline of box plants. (Bureau of Plant Industry).

FURTHER INCREASE OF BLIGHT, BACILLUS AMYLOVORUS, IN NEW YORK

E. M. Hildebrand
Cornell University

The year 1933 may be characterized as another bad blight year in New York, the disease being particularly damaging to pears, apples, and

quinces. Although the losses were considerable in 1932, they were much greater in 1933. Blossom blight on apple according to growers was the worst in many years. A survey was made of 28 counties comprising the three large fruit growing districts -- Western New York, Hudson Valley, and Champlain Valley -- and the less intensive Finger Lakes district of central New York. The results may be summarized as follows: For the seasons of 1932 and 1933 damage was severe in, respectively, 5 and 12 counties; moderate to severe in 8 and 11 counties; slight to moderate in 12 and 3 counties; and very slight or practically nil in 3 and 2 counties.

Outbreaks of the disease were distinctly localized. Many apple orchards suffered almost complete blighting of the flowers followed by profuse twig blight with consequent loss of crop for the current season and fruit spurs for following seasons. The percentage of fruit-spur infection in six common varieties in five different orchards in central New York were, respectively: Rhode Island Greening, 70.4; Rhode Island Greening, 78.2; T. C. King, 64.3; Wealthy, 51.3; Wealthy, 38.7; and Northern Spy, 25.0. The principal varieties named approximately in order of the extent of injury were: Rhode Island Greening, King, Alexander, Wealthy, Baldwin, Spitzenburg, Fall Pippin, Tolman, McIntosh, Northern Spy, Newtown, Yellow Transparent, Cortland, Rome Beauty, Northwestern Greening, Delicious, Jonathon, Fameuse, and Starking.

The principal pear varieties observed named approximately in order of extent of injury were Clapp Favorite, Bartlett, Bosc, Seckel, and Kieffer. The sporadic nature of blight coupled with inadequate control measures for epidemic outbreaks are undoubtedly the biggest factors gradually driving the pear industry out of the State. In the last decade the number of pear trees in New York has shrunk over one-third.

DISEASES OF PERSIAN WALNUT IN OREGON

A leaf spot of seedling Persian (English) walnuts (Juglans regia) due to Ascochyta juglandis Boltsch. was the cause of a premature dropping of the leaves in an orchard near Leaburg, Oregon. As far as the writer is aware, this is the first time that this particular leaf spot disease has been reported on Persian walnuts in the Pacific Northwest. (P. W. Miller, October 21).

The only previous report of the occurrence of this fungus in the United States is that of Dr. G. E. Stone, in Mass. Agr. Exp. Sta. Bul. 170, p. 194, 1916, as occurring on butternut, Juglans cinerea. Dr. W. H. Davis, of the Massachusetts Station at Amherst writes that no specimen of this fungus can be found in their collections and no definite report of its occurrence in their disease survey records. The fungus is not reported in Seymour's Host Index, and it seems probable therefore that Stone's report was a mistake. (G. L. Shear.)

A leaf spot disease due to Microstroma brachysporum (Pk.) Vest. was found in Oregon during the season just past on leaves of Juglans regia (Meylan variety). The disease was not severe enough, however, to cause any appreciable premature dropping of the leaves. As far as can be

ascertained by a perusal of available literature, this particular leaf spot has not been reported heretofore on Juglans regia in the Pacific Northwest. (P. W. Miller, October 28). Specimens of both of these fungi have been received and deposited in the Herbarium.

A LITTLE KNOWN FUNGUS ON PECANS

J. B. Demaree, of the laboratory of Pecan Investigations, at Albany, Georgia, recently sent specimens of a fungus on pecan leaves for determination. The collections were made at Utley, Texas, in October of this year. The fungus was found to belong to the genus Articularia of von Höhnel. Mycological studies are being made to determine its specific identity. No reference nor report has been found of the occurrence of this fungus on pecan. However, the Mycological Collections of the Bureau of Plant Industry contains an identical specimen, also collected in Texas in 1900 by R. H. Price near College Station. This specimen was identified as Microstroma juglandis (Bereng.) Sacc. but a microscopic examination showed it to be identical with Articularia.

Mr. Demaree stated that his material was collected on green leaves. (Vera K. Charles, Nov.)

RECENT OBSERVATIONS ON DISEASES CAUSED BY NEMATODES

G. Steiner and Edna M. Buhrer

I. The following findings of interest and significance are reported:

Anguillulina balsamophila in leaves of a new host plant, the sunflower (Helianthus annuus) in Ellensburg, Washington, collected and identified by W. D. Courtney.

Bentgrass (Agrostis tenuis), heavily infested by Anguillulina graminophila, was collected by F. P. McWhorter in Corvallis, Oregon. This parasite, first described from England early in 1933, is new to this country.

Anguillulina dipsaci infesting a new host, the moss phlox (Phlox subulata) from Washington, D. C. (identified by J. R. Christie).

Anguillulina dipsaci in Sprekelia formosissima (St. James lily) bulbs from Glasgow, Scotland. A new locality for the disease on this host. Submitted by D. P. Limber of the U. S. D. A. Inspection House.

Thirteen new hosts of the root-knot nematode (Heterodera marioni): Sansevieria zeylanica var. laurentii from West Palm Beach, Florida, (through the courtesy of Mr. H. E. Spencer); Ginkgo biloba (the maidenhair-tree) from Perkinston, Mississippi, sent in by T. D. Persons; Solanum capsicastrum (the false Jerusalem-cherry) from a greenhouse in Washington, D. C.; Delphinium elatum hybrid from B. H. Ballard of East Falls Church, Virginia; Lespedeza sericea from Sandy Spring, Maryland, (through the courtesy of L. T. Leonard); and 8 plants from a heavily infested ornamental bed in Washington, D. C.: Browallia viscosa, Convolvulus japonicus, Cuphea

platycentra, Iresine lindeni, Peristrophe angustifolia, Phlox drummondi, Torenia fournieri, and Verbena luminosa.

The presence of Anguillulina pratensis in lesions of Irish potatoes from Orangeburg, South Carolina, (through the courtesy of Miss L. Cash).

Two instances of Paraphelenchus pseudoparietinus in the cocklebur, one from Fayetteville, Arkansas (Xanthium sp.) and the other from Alexandria, Virginia, (Xanthium americanum). (Collectors: H. P. Rosen, and Mrs. Civella A. Brooks, respectively). The nematodes occur in swellings on the base of the stem.

Aphelenchoides tenuicaudatus in ginger roots from China, intercepted by the Bureau of Plant Quarantine inspectors at New York, and another lot at Boston.

II. In explanation of the names here used for the first time in the Plant Disease Reporter, the following statement is submitted:

The generic names Anguillulina, Gervais and van Beneden 1859, and Tylenchus, Bastian 1865, are synonyms. However, Tylenchus had been placed on the list of nomina conservanda published by Apstein in 1915. This list has not been accepted as such by the International Commission on Zoological Nomenclature. In view of the fact that there was a genus Anguillula, being type of a subfamily, family and order, the following situation arose through the validation of Anguillulina for Tylenchus.

Genus:	Anguillula	Anguillulina (Tylenchus)
Subfamily:	Anguillulinae	Anguillulininae (Tylenchinae)
Family:	Anguillulidae	Anguillulinidae (Tylenchidae)
Order:	Anguillulata	

This might have involved confusion since the plural of the generic name, Anguillulina, and the singular of the subfamily name, Anguillulinae, are identical. It was thought that this situation might be considered by the International Commission on on Zoological Nomenclature as valid reason to suspend the rules and reinstate Tylenchus as official name. However, Peters proved with reasonable certainty that Anguillula is not a valid name and proposes Turbatrix as a substitute. It seems therefore that, according to the rules of zoological nomenclature, no further objections to Anguillulina as a valid name exist. Accordingly the Division of Nematology of the U. S. Bureau of Plant Industry in the future will follow other agencies and use Anguillulina as the generic name instead of Tylenchus.

DISEASES OF ALFALFA IN CALIFORNIA

J. L. Weimer

Bacterial wilt (Aplanobacter insidiosum) continues to be the most destructive disease of alfalfa in the southern part of the Sacramento River Valley, and in the San Joaquin, Antelope, and Majave River Valleys. The

known distribution of this disease in southern California was extended somewhat this summer by its discovery near Van Nuys by H. L. Westover and the writer. It was previously known to be present in the Saugus-Newhall section. It seems probable that the wilt was brought onto this large dairy ranch near Van Nuys in hay from the Antelope or Mojave Valley.

Dwarf (Cause unknown). The known distribution of this disease is limited to southern California and the southern part of the San Joaquin Valley. This disease is equally as destructive as wilt where it occurs. As high as 60 per cent of natural infection was found in November in some plants transplanted to the field in rows last spring. Five to 10 per cent infection in new stands is common. Many rows of alfalfa in the writer's plots have 25 to 50 per cent of infected plants at the end of their second summer and some 3 year old rows have only now and then a healthy plant left.

Rust (Uromyces medicaginis) was severe on alfalfa in my plots in October. Nearly 100 per cent of the plants were affected and many leaves were lost.

Leaf spot (Pseudopeziza medicaginis) is usually prevalent in the early spring months but is of little importance during the remainder of the year. It was less severe than usual last spring.

Yellows (Leafhopper). This trouble has never been seen to do any appreciable damage in commercial alfalfa fields in California, but it is very severe in my plots some years. It was less severe this year than last. It does not become destructive until late summer and fall. (Nov. 14).

HELMINTHOSPORIUM ON CORN AND VELVET GRASS IN OREGON

Roderick Sprague sent in specimens of corn and of velvet grass (Notholcus lanatus) affected with Helminthosporium turcicum Pass., and H. triseptatum Drechsler, respectively, collected in Lincoln County, Oregon, November 6. Many of the corn leaves and some of the tassels and tips of the ears had been blasted within the last five weeks. The corn was still growing and did not show frost injury.

PHYTOPHTHORA INFESTANS IN NEW HAMPSHIRE

O. Butler reported that late blight on tomatoes is usually very rare in New Hampshire, but this year it proved very destructive late in the season, owing to the unusually wet warm autumn. It was also more prevalent than usual on potatoes in the southern counties.

ROOT ROTS ON DECIDUOUS FRUIT TREES IN THE EASTERN UNITED STATES

J. S. Cooley

During the past two years scouting trips were made to determine the kind and relative prevalence of root rots on peach and apple trees into the following fruit regions:

The Shenandoah-Cumberland Valley, the Piedmont of Pennsylvania, Maryland, and Georgia, the Vincennes region of Indiana, and the Cobden region in southern Illinois.

A brief statement of the root troubles observed on the apple trees in these regions follows:

Xylaria was observed in a few cases in the Cumberland Valley (Waynesboro) in Pennsylvania, but not in the Piedmont (Biglerville). Winter injury about the collar, however, was very prevalent in these regions of Pennsylvania.

In the Shenandoah Valley of Virginia and West Virginia and also the Piedmont of Virginia, Xylaria was so prevalent that it was observed in nearly every orchard examined. There was considerable variation in the severity. In the main, it was much more prevalent in those orchards or parts of orchards where the trees had been subjected to some type of adversity, such as winter injury, starvation, severe drought, too close planting, which promotes drought conditions, or shallow soil because of shale hardpan or rock, which also is essentially a drought condition.

The fact that many trees are not affected, even though they have been subject to conditions favoring susceptibility and have diseased trees nearby, would indicate that either the disease is not readily distributed or infection does not readily take place; or possibly both factors are operating.

In northern Georgia (Cornelia and Cedarville) no Xylaria was observed, but there were a number of root troubles due to one or more of such causes as woolly aphis, winter injury, and apparently too deep planting in a heavy clay soil.

In the Vincennes region in Indiana Xylaria was not observed, but root troubles were prevalent. Winter injury (more on the roots than on the collars) seems to have initiated the troubles, which were usually followed by heart-rot infection. In southern Illinois (Cobden) root troubles were very prevalent, but they did not seem to be associated with a fungous parasite. The trouble was apparently associated with one or more of the complex of sun scald, drought injury, and winter injury about the collar. Xylaria was not observed.

In the Glen Burnie, Maryland, region a rather thorough examination was made, but no Xylaria was observed. On the Eastern Shore of Maryland and Delaware it was observed in only two orchards and those had been planted very close in a poorly drained soil, so that drought conditions prevailed, even though the region does not usually suffer from summer droughts.

White root rot (unidentified). A white fungus was frequently found growing over the roots of apple trees. In most cases this was apparently some fungus following injury or death of the roots. A parasitic white root rot, however, was observed in two localities, Cobden, Illinois, and Covesville, Virginia. It apparently is not abundant in those regions examined. This root rot envelops the root in a mat of mycelium. The roots are scaly. Where the fungus penetrates and kills the cambium it causes a depression resulting in a very irregular and gnarled appearance of the root. It kills quickly after attacking, but apparently does not attack readily.

Armillaria. Although Armillaria has been observed by other workers affecting apple trees in these regions, the writer observed it only once, at Vienna, Virginia. Here the soil was poorly drained and conditions were not favorable for the maintenance of good vigor.

Armillaria on stone fruits was observed affecting two peach trees in Maryland in a 7-year-old peach orchard that had succeeded another peach orchard. It appeared to be prevalent in the Sand Hill region of North Carolina, but with that exception it was not observed to be a very common or serious peach-tree disease in the regions where observations were made.

DOWNY MILDEW ON SPINACH IN VIRGINIA

The first spinach plants affected with downy mildew (Peronospora effusa) were found on November 1 this year, which is about a month later than the disease usually starts. Its delayed appearance apparently is due to the extremely dry weather that has prevailed in southeastern Virginia during the last seven weeks. The few diseased plants that have been found so far are located in the low wet spots of fields that have produced fall crops of spinach for at least the last five years. The disease is not expected to cause much damage to this season's crop. (Harold T. Cook - Nov. 4).